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NEIC

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CLEAN WATER ACT COMPLIANCE INVESTIGATION

Wheelabrator Saugus, Inc.

100 Salem Turnpike
Saugus, Massachusetts
NEIC Project No.: VP1083

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APPENDICES (*NEIC-Created Documents)

A NPDES Permit No. MA0028193 (36 pages)
B Industrial Wastewater Discharge Permit No. SS013 (14 pages)
C* NEIC Field Investigation Photographs (28 pages)
D June 29, 2014, Outfall 001 pH Logbook Monitoring Record (1 page)
E April 2014 Outfall 002 pH Traveling Screen Wash Water Log Sheets (60 pages)
F July 7, 2014, Inspection Follow-up Correspondence (8 pages)
G IWDP Semiannual Monitoring Reports (446 pages)
H July 15, 2014, Inspection Follow-up Correspondence (20 pages)
I Calibration Records for IWDP pH Meter (12 pages)
J August 11, 2014, Inspection Follow-up Correspondence (4 pages)

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and provides a clear indication of the end of this report.**

INTRODUCTION

At the request of U.S. Environmental Protection Agency (EPA) Region 1, EPA's National Enforcement Investigations Center (NEIC) conducted a Clean Water Act (CWA) compliance investigation of the Wheelabrator Saugus, Inc. (Wheelabrator) facility located in Saugus, Massachusetts. Pollution control, wastewater generation, and management operations for the facility are subject to environmental permits and regulations administered by the EPA, Massachusetts Department of Environmental Protection (MassDEP), and Lynn (Massachusetts) Water and Sewer Commission.

FACILITY BACKGROUND

Wheelabrator, formerly Refuse Energy Systems Company (RESCO), operates a waste-to-energy facility in Saugus, Massachusetts. Municipal solid waste (MSW) is combusted at the facility to produce 38 megawatts of electricity. The facility began operation in 1975 and processes up to 1,500 tons per day of MSW, which is collected from municipalities including, but not limited to, those located in Essex, Middlesex, and Suffolk Counties.

REGULATORY BACKGROUND

Wheelabrator is authorized to discharge wastewater to the Saugus River under National Pollutant Discharge Elimination System (NPDES) permit No. MA0028193 (**Appendix A**). The NPDES permit authorizes Wheelabrator to discharge wastewater through two outfalls to the Saugus River. Wheelabrator is authorized to discharge non-contact cooling water (NCCW) through outfall 001, with effluent limitations and monitoring requirements for flow, pH, temperature, and temperature rise. Wheelabrator is authorized to discharge traveling screen wash water through outfall 002, with monitoring requirements for flow and pH.

Wheelabrator is authorized to discharge stormwater under EPA's Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity (MSGP) from two locations. The MSGP was last issued in 2008 and became effective on September 29, 2008 (2008 MSGP). Wheelabrator submitted a Notice of Intent (NOI) to EPA and obtained coverage under the 2008 MSGP for stormwater discharges from the waste-to-energy facility (permit tracking No. MAR05CX26). Wheelabrator also submitted a separate NOI and obtained separate coverage under the 2008 MSGP for stormwater discharges from an on-site landfill located adjacent to the waste-to-energy facility (permit tracking No. MAR05CZ86). Wheelabrator has prepared separate stormwater pollution prevention plans (SWPPPs) for each location.

Wheelabrator is authorized to discharge industrial wastewater to the Lynn Water and Sewer Commission wastewater treatment facility (Lynn WWTF) under Industrial Wastewater Discharge Permit (IWDP) No. SS013 (**Appendix B**). The permit authorizes Wheelabrator to discharge process wastewater (landfill leachate) through one outfall (001) to the Lynn WWTF, with effluent limitations

and monitoring requirements for flow, pH, temperature, biochemical oxygen demand, total suspended solids, oil and grease, cadmium, lead, and zinc.

ON-SITE INSPECTION SUMMARY

Introduction

NEIC conducted the on-site inspection of Wheelabrator from June 26 through June 30, 2014. The NEIC inspection team consisted of Daren Vanlerberghe (project manager) and Christine Alvarez. Credentials were presented to Eric Lucier, Wheelabrator Plant Manager, during the opening meeting on June 26, 2014. A closing meeting was held on June 30, 2014, to discuss the preliminary inspection observations. NEIC stressed that final determinations will be made in conjunction with EPA regional personnel and following review of documents provided by Wheelabrator.

Inspection Activities

The NEIC inspection team assessed Wheelabrator's compliance with the NPDES permit requirements, 2008 MSGP requirements, and IWDW requirements by conducting detailed discussions with Wheelabrator staff and by observing facility process areas, wastewater generation sources, treatment facilities, stormwater management areas, outfall locations, and sampling and monitoring locations. Photographs taken by the NEIC inspection team are located in **Appendix C**.

Process Overview and Wastewater and Stormwater Management

Facility operations at this site began in 1975 and the facility processes up to 1,500 tons per day of MSW. Initially, steam produced as a result of this combustion process was sold to the General Electric Company in Lynn, Massachusetts. In 1985, the facility was modified to include the installation and operation of a steam-driven turbine generator capable of generating 38 megawatts of electrical power. About 11 percent of this electricity is used for the facility's own power needs. The rest of the electricity is sent to a substation, where it is stepped up from 13,800 volts to 115,000 volts, and made available to the local electricity grid.

The process begins when MSW haulers enter the facility, weigh in at the scale house, and then deliver waste to an enclosed receiving area. A front-end loader pushes the refuse into a holding pit, which has a maximum capacity of approximately 10,000 tons. The facility uses two overhead cranes (one typically in use) to move the refuse within the pit and to transfer it from the pit to the boiler feed hoppers, where it is then fed into two water-wall boilers. Heat generated by the combustion of the MSW in the boilers generates steam. A temperature of roughly 2,000 degrees Fahrenheit (°F) is achieved above the grates in the boilers. Secondary air is forced over the fire within the boiler to ensure complete burning of the MSW and off-gases. The water used for heat recovery in the boiler is contained in a closed-loop system.

The generated steam powers a steam turbine and is then cooled to the liquid phase by a non-contact water condenser. The non-contact condenser is equipped with a once-through cooling system that uses water from the Saugus River. The facility operates a pump house on the bank of the Saugus River equipped with two pumps capable of delivering non-contact cooling water at various flow rates, depending on plant operational needs and ambient river water temperature conditions. Once the water has passed through the condenser, it continues through the condenser piping and is discharged to the Saugus River through a staged diffuser located on the bottom of the river channel (NPDES permit outfall 001). The diffuser is 170 feet long and has 15 discharge ports spaced about 10 feet apart.

The pump house also includes a trash rack and a traveling screen. The trash rack traps large debris and consists of steel bars placed in front of the intake structure. The trash rack is cleaned manually, as needed, and debris collected from it is transferred to the refuse pit and burned in the plant. The traveling screen's smaller mesh openings enable it to catch smaller items, including fish, but the mesh openings are too large to catch fish eggs or larvae or any other tiny organisms living in the water. The traveling screen is rotated once every 4 hours or in response to a preset pressure drop. It may also be rotated as needed upon visual inspection, if debris caught on the screen is found to restrict flow through it. The traveling screen is washed by river water using both low-pressure and high-pressure water flows. Material collected from the traveling screen is returned via a fish return pipe to the Saugus River channel, about 300 feet from where the visible piping ends. Debris collected from the fish return system is taken to the refuse pit and burned in the plant.

Within the pump house, water is drawn from the pump discharge line for the fish return trough and used to wash the traveling screens. This wash water returns to the Saugus River via the fish return line or at the pump house (NPDES permit outfall 002). Water is also drawn by booster pumps and used as seal water for the bearings on the river water pumps.

Several wastewater streams are reused within the facility, including boiler blowdown, backflow from the facility's reverse osmosis demineralizer system, quench water (which contacts ash), and other facility wash waters. These waters are treated and used to fill various water-filled conveyers; any remaining water is pumped to wastewater tanks and then used (evaporated) to control temperatures in the spray dryer absorbers, which are components of the facility's air emission control systems. Stormwater discharges from the waste-to-energy facility are covered under the 2008 MSGP.

Wheelabrator operates an on-site, 207-acre landfill located adjacent to the waste-to-energy facility. Approximately 175 acres of the site have stormwater discharges associated with industrial activity (i.e., active landfill operations). The remaining areas generally consist of natural tidal marshes. The landfill is permitted to accept bottom ash, air pollution control residue, and other residues from the combustion processes at the adjacent waste-to-energy facility. The landfill also is permitted to accept recycling residue from other Wheelabrator

facilities in the region. Trucks operated by Wheelabrator personnel, or contracted by Wheelabrator, haul these materials from the Wheelabrator facility directly to the landfill. The landfill also receives off-site soils for use as operational cover. Stormwater discharges from the landfill are covered under the 2008 MSGP.

Leachate is collected at the landfill by a perimeter groundwater containment and collection system. The leachate collection system consists of a slotted pipe placed in a sand envelope encircling the perimeter of the landfill to the interior of a slurry wall. Leachate collected by this pipe flows by gravity to one of three pump stations located around the perimeter of the landfill. These pump stations pump the leachate to the waste-to-energy facility, where it may be either treated for reuse within the facility or discharged to the Lynn WWTF. Before it is discharged to the Lynn WWTF, the leachate is treated in a lamella (inclined-plate) treatment system. Effluent from the lamella system (IWDP outfall 001) is combined with sanitary wastewater at an on-site lift station for transfer to the Lynn WWTF.

SUMMARY OF FINDINGS AND OBSERVATIONS

Findings and observations identified by NEIC during the investigation are summarized in **Table 1**. These findings and observations are linked to specific supporting documents that can be found in individual appendices to this table. These findings and observations can be categorized as either areas of potential noncompliance or areas of concern. Areas of concern are inspection observations of potential problems or activities that could impact the environment, result in future or current noncompliance, and/or are areas associated with pollution prevention.

Table 1. SUMMARY OF FINDINGS AND OBSERVATIONS
Wheelabrator Saugus, Inc.
Saugus, Massachusetts

#	Regulatory Citation	Findings/Supporting Notes	Evidence
AREAS OF POTENTIAL NONCOMPLIANCE			
1	<p>NPDES Permit Application No. MA0028193, Standard Conditions Part II.C.1.c. Monitoring and Records – Records of monitoring information shall include:</p> <p>(1) The date, exact place, and time of sampling or measurements;</p> <p>(2) The individual(s) who performed the sampling or measurements;</p> <p>(3) The date(s) analyses were performed;</p> <p>(4) The individual(s) who performed the analyses;</p> <p>(5) The analytical techniques or methods used; and</p> <p>(6) The results of such analyses.</p> <p>NPDES Permit Application No. MA0028193, Standard Conditions Part II.C.1.d. Monitoring and Records – Monitoring results must be conducted according to test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, unless other test procedures have been specified in the permit.</p> <p>40 Code of Federal Regulations (CFR) § 136.3, Table II – Required Containers, Preservation Techniques, and Holding Times – Hydrogen Ion (pH) maximum holding time – analyze within 15 minutes.</p>	<p>Finding NPDES permit compliance monitoring records maintained by Wheelabrator did not include the analytical techniques or methods used for samples collected at outfall 001 and outfall 002 for pH analyses. Also, outfall 002 pH monitoring records did not include the time of sampling.</p> <p>In addition, Wheelabrator’s monitoring records did not include the time analyses were performed for pH samples collected at outfall 001 and outfall 002. Because the pH analyses times were not recorded, Wheelabrator could not document that pH samples were being analyzed within 15 minutes of sample collection.</p> <p>Supporting Notes Wheelabrator is required by the NPDES permit to monitor for pH at outfall 001 by collecting a weekly grab sample and at outfall 002 by collecting a monthly grab sample for analysis. The pH samples at each outfall are collected by a Wheelabrator operator and taken to an on-site laboratory for analysis. Outfall 002 pH samples are typically collected the first Wednesday of each month.</p> <p>Monitoring records for pH are maintained in a logbook for outfall 001 (Appendix D) and on a traveling screen wash water log sheet for outfall 002 (Appendix E). The logbook and log sheet did not include the analytical techniques or methods used for pH samples collected at outfall 001 and 002. Also, outfall</p>	<p>Appendix A – NPDES Permit No. MA0028193</p> <p>Discussions with Wheelabrator staff</p> <p>Appendix D – June 29, 2014, Outfall 001 pH Logbook Monitoring Record</p> <p>Appendix E – April 2014 Outfall 002 pH Traveling Screen Wash Water Log Sheets</p> <p>Appendix F – July 7, 2014 and August 26, 2014, Inspection Follow-up Correspondence</p>

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Wheelabrator Saugus, Inc.
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		<p>002 pH monitoring records did not include the time of sampling.</p> <p>Following the NEIC inspection, Wheelabrator provided information regarding changes made to address this issue (Appendix F). Wheelabrator modified the logbook and log sheet used for pH monitoring results for outfall 001 and 002 to include the time of the sample collection and the time of analysis. Wheelabrator also modified sample procedures to include the recordkeeping requirements as well as noting that pH measurements must be completed within 15 minutes of sample collection. Wheelabrator made additional modifications to address the monitoring record requirements.</p>	
2	<p>Lynn Water and Sewer Commission Industrial Wastewater Discharge Permit No. SS013, Part 2. Monitoring Requirements, Sampling and Analysis – <i>All analyses shall be performed in accordance with the procedures established by the EPA Administrator pursuant to Section 304(h) of the Clean Water Act and contained in 40 CFR part 136 and amendments thereto or with any other test procedures approved by the EPA Administrator (see 136.4 and 136.5). Sampling shall be performed in accordance with the techniques approved by the EPA Administrator.</i></p> <p>40 CFR § 136.3, Table II – Required Containers, Preservation Techniques, and Holding Times – <i>Oil and grease container – glass.</i></p>	<p>Finding Chain of custody (COC) records, included with Wheelabrator's semiannual monitoring reports for monitoring of outfall 001 under the IWDP, indicate several discrepancies related to the type of container used to collect oil and grease samples. Oil and grease samples are required to be collected in a glass container.</p> <p>Supporting Notes Wheelabrator is required by the IWDP to monitor for oil and grease at outfall 001 by collecting four grab samples during a spring reporting period (i.e., between April 1 and May 15) and four grab samples during a fall reporting period (i.e., between October 1 and November 15). Wheelabrator contracts GZA GeoEnvironmental, Inc. (GZA) to manage compliance sampling for the IWDP. Compliance samples are collected for Wheelabrator by ESS Laboratory (ESS), a subcontractor to GZA.</p> <p>As required by the IWDP, Wheelabrator submits semiannual monitoring reports summarizing monitoring results for each respective reporting period. Included with the semiannual reports are COC records for the compliance samples (Appendix G). The COC records indicate the type of container used for collecting each sample by parameter. NEIC identified several discrepancies related to the type of container used to collect oil and grease samples.</p> <ul style="list-style-type: none"> The fall 2011 report includes COC records that indicate oil and grease samples were collected in plastic 	<p>Appendix B – IWDP No. SS013</p> <p>Appendix G – IWDP Semiannual Monitoring Reports</p> <p>Appendix H – July 15, 2014, Inspection Follow-up Correspondence</p>

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		<p>containers. Also, a second COC record for each sample in the fall 2011 report indicates that oil and grease samples were collected in glass containers.</p> <ul style="list-style-type: none"> • The spring 2012 report includes COC records that indicate oil and grease samples were collected in plastic containers. Also, the spring 2012 report includes COC records for which the type of container used to collect oil and grease samples appears to be changed in handwriting. • The fall 2012, spring 2013, fall 2013, and spring 2014 reports all contain COC records for which the type of container used to collect oil and grease samples is not clearly designated, as both plastic and glass are marked in the row corresponding to the oil and grease samples. <p>Following the NEIC inspection, Wheelabrator provided information to clarify and describe changes made to address this issue (Appendix H). Wheelabrator and ESS state that standard practice is to collect oil and grease samples in glass containers, and that those COC records indicating plastic containers were in error. Wheelabrator representatives also stated that they have requested the contractors to list each sample container on a separate line on the COC record to prevent confusion regarding samples and sample containers being used.</p>	

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Wheelabrator Saugus, Inc.
Saugus, Massachusetts

#	Regulatory Citation	Findings/Supporting Notes	Evidence
AREAS OF CONCERN			
A	<p>Lynn Water and Sewer Commission Industrial Wastewater Discharge Permit No. SS013, Part 2.A. Monitoring Requirements – During the period 9/30/2013 to 9/30/2017 the Permittee shall monitor outfall(s) 00,1 for the required pollutants as listed in the Effluent Limit Concentrations table at the indicated frequency and standards.</p> <p align="center"><i>pH frequency/sample type – continuous/probe</i></p> <p>Lynn Water and Sewer Commission Industrial Wastewater Discharge Permit No. SS013, Part 6.C. Monitoring and Records – Representative Sampling: Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge. All samples shall be taken at the monitoring points specified in this permit and, unless otherwise specified, before the effluent joins or is diluted by any other wastestream, body of water, or substance. All equipment used for sampling and analysis must be routinely calibrated, inspected and maintained to ensure their accuracy. Monitoring points shall not be changed without notification to and the approval from the LWSC.</p>	<p><u>Concern</u> The type of calibration and calibration results for the continuous pH meter used for monitoring pH at outfall 001 under the IWDP was a concern.</p> <p><u>Supporting Notes</u> Calibration records from 2012 for the pH meter show that a two-point calibration using pH standards of 4 and 10 was being conducted, while the typical pH range of the discharge is closer to 7 (Appendix I). The calibration of pH meters should be closer to the expected pH range of the discharge being monitored, and a three-point calibration is recommended.</p> <p>In addition, monthly calibration records from 2012 for the pH meter show instances where the pH meter was significantly out of range prior to the calibration. Some initial readings were off by as much as 1 pH unit as compared to the 4 and 10 pH standards prior to calibration. The accuracy of the pH meter readings between calibrations during this time is a concern.</p> <p>Following the NEIC inspection, Wheelabrator provided information to clarify and describe changes made to address this issue (Appendix H). Wheelabrator modified the pH meter calibration procedure to include a three-point calibration check, including one at a pH standard of 7.</p>	<p>Appendix B – IWDP No. SS013</p> <p>Appendix I – Calibration Records for IWDP pH Meter</p> <p>Appendix H – July 15, 2014, Inspection Follow-up Correspondence</p>
B		<p><u>Concern</u> Drainage from the area west of the scale house could flow directly toward Rumney Marsh, which could potentially result in contaminated stormwater runoff reaching the marsh.</p> <p><u>Supporting Notes</u> The area on the west side of the facility property includes the vehicle access road, scale house, and road to the municipal solid waste tipping floor. The area is bounded by a chain-link fence west of the access road and scale house. A sediment sock was placed at the base of a portion of the fence. However, the area directly west of the scale house does not have the sediment sock or any other control to prevent runoff from leaving the site in that area (Appendix C, IMGP0021, IMGP0022, IMGP0023).</p>	<p>Appendix C – NEIC Field Investigation Photographs</p> <p>Appendix J – August 11, 2014, Inspection Follow-up Correspondence</p>

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		<p>The access road west of the scale slopes toward the fence. West of the fence is a vegetated area and then Rumney Marsh. Spills or leaks from vehicles entering the site and the scale could contaminate any runoff from the area.</p> <p>Following the NEIC inspection, Wheelabrator provided information to clarify and describe changes made to address this issue (Appendix J). Wheelabrator installed an asphalt berm at the inbound scale to prevent spills in runoff flowing into the wetland. According to Wheelabrator, the length of the berm was arrived at looking at the surface elevations and evaluating flow directions.</p>	
C		<p><u>Concern</u> The NPDES permit does not reflect that the flow measurement for outfall 001 is taken from the inlet pipe rather than the discharge.</p> <p><u>Supporting Notes</u> The discharge flow from NPDES permit No. MA0028193 outfall 001 (once-through non-contact cooling water) reported on discharge monitoring reports is taken from a flow meter on the inlet river water pipe rather than from the effluent discharge pipe.</p>	Appendix A – NPDES Permit No. MA0028193
D		<p><u>Concern</u> The NPDES permit does not reflect that the pH sample for outfall 001 is collected from one of the discharge pipes rather than the combined discharge pipe.</p> <p><u>Supporting Notes</u> The pH sample for monitoring compliance from NPDES permit No. MA0028193 outfall 001 is collected from one of two discharge pipes. The non-contact cooling water discharge exits the turbine building in two pipes (north and south) and then combines into one pipe before discharging into the Saugus River. The pH sample for outfall 001 is collected from a sample tap from the south discharge pipe.</p>	Appendix A – NPDES Permit No. MA0028193